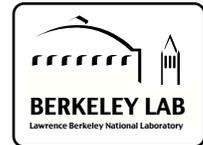


THE JOHN LAWRENCE SEMINARS



"A SWITCH CONTROLLING DNA NETWORKS, COMPACTION, AND BACTERIAL PATHOGENICITY"

MICHAL HAMMEL, PH.D.
BERKELEY LAB

Functional bacterial chromosome (nucleoid) compaction and organization at the molecular level is surprisingly enigmatic, but depends upon the highly conserved, histone-like proteins HU $\alpha\alpha$ and HU $\alpha\beta$. Here we determined the crystal structures of these chromosome-associated proteins in complex with native duplex DNA. Distinct DNA binding modes of HU $\alpha\alpha$ - and HU $\alpha\beta$ elucidate fundamental features of bacterial chromosome packing regulating gene transcription. By combining crystal structures with solution X-ray scattering results, we determined architectures of HU-DNA nucleoproteins in near physiological conditions. Moreover, structural characterization of the charge-altered HU $\alpha\alpha$ - DNA complex reveals an HU molecular switch that can condense nucleoid and reorganize the transcriptional program. Collective findings suggest that shifts between networking, cooperative and non-cooperative HU multimerization on DNA control DNA compaction and supercoiling, independently of cellular topoisomerase activity.

TUES., NOV. 10TH
4:00 P.M.

717 POTTER STREET
ROOM 141
BERKELEY LAB

HOST:
JOHN TAINER

Schedule of Seminars: <http://johnlawrenceseminars.lbl.gov>
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